Space Weather Forecast

Issued on Saturday, 10 December 2022 at 01:13 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

Space Weather Forecast Headline: Increasing Chance of Moderate-class X-ray flares.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity has been Low over the past 24 hours, although during the second half of the day the frequency of the flares increased as a far side region, responsible for most of the flares, rotated closer to the east limb. The largest Common class flare peaked at 09/1413 UTC, from the far-sided region, but another moderate size Common class flare also occurred at 09/2242 UTC from AR3157. AR3157 is currently the most magnetically complex region on the disc. Meanwhile AR3153 remains the largest on the disc, in the southwest quadrant. However, over the past 24 hours AR3153 has experienced decay in size and spot number, while also magnetically simplifying a little. The remaining 5 numbered regions, and a new yet to be numbered region on the southeast limb, are all small, weak, magnetically simple and also relatively stable.
A southeast 'filament' (arc of plasma) was seen to lift off in some extreme UV imagery and ground-based near-infrared between 09/0600-0900UTC does not appear to have generated an Earth directed Coronal Mass Ejection (CME). Other events visible were determined to be far-sided, with perhaps the most notable seen heading eastwards into the UTC afternoon of 9th December, perhaps hinting at an arriving active region in this vicinity. Therefore, no confirmed Earth-bound CMEs were observed in the period.

Solar Wind / Geomagnetic Activity: Solar winds were indicative of an ongoing connection to the fast wind, with Elevated speeds between generally 525-550 km/s. The number of particles in the solar wind was steady and near the long-term average, while their associated magnetic field was predominantly weak, just occasionally tipping into the Moderate strength category. The important north-south component of the solar winds magnetic field fluctuated, but was often weakly negative, especially at first. The resulting geomagnetic activity was initially Active, then quickly declined to become Quiet to Unsettled.

Energetic Particles / Solar Radiation: No solar radiation storms were observed.

Four-Day Space Weather Forecast Summary

Solar Activity: There is a chance of isolated Moderate class flares each day, currently most likely from AR3153 or AR3157. However, as an active region on the far side is expected to rotate onto the disc either late today or more likely tomorrow, the chance of significant flares increases slightly.

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Solar Wind / Geomagnetic Activity: No Earth-directed CMEs currently feature in the forecast. The only fast wind in the forecast is the incumbent high speed stream. Because the solar wind magnetic field is now reducing, the peak risk of Minor Geomagnetic Storm is now thought to have passed from this feature, perhaps surviving as a vestigial slight chance on Saturday, before decaying later in the UTC weekend to leave more reliably quiet conditions.

Energetic Particles / Solar Radiation: No solar radiation storms are expected, but there remains a daily slight chance of seeing S1+ levels if any significant flares were to occur.

Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	5	1	1	1
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	No	20	25	30	30
Very Active	R3 to R5 X	No	1	1	5	5

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Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	**≥ S1**	No	5	5	5	5
Very Active	**≥ S3 ***	No	1	1	1	1
* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)						

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